REMARKS

Claims 1-35 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

CLAIM OBJECTIONS

The Examiner objected to several claims, including at least claims 8 and 9, because of a grammatical oversight in the phrase "a finish portion of said hollow container" that resulted in the incorrect use of the word "finish". Applicants have accordingly amended Claims 8, 9, 16, 17, 25, 26, 34, and 35 to replace "finish" with "finished". Additionally, Applicants have accordingly made extensive amendments to the specification in order to replace "finish portion" with "finished portion". Applicants believe this objection is now moot.

REJECTION UNDER 35 U.S.C. § 103

Claims 1, 2, 4-6, 8, 10, 12-14, 16, 18, 19, 21-23, 25, 27, 28, 30-32, and 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee et al. (U.S. Pat. App. Pub. No. 2004/0085311) in view of Bentley et al. (U.S. Pat. No. 6,437,784). This rejection is respectfully traversed.

Referring to Claim 1, Lee et al. do not show, teach, or suggest a solid model definition module for defining a three-dimensional outer shape of a hollow container as a solid model that is at least partially filled with contents on the basis of a shape condition, as admitted by the Examiner. **Final Office Action, p. 6 (June 13, 2005).**

Bentley et al. do not remedy the shortcomings of Lee et al. Bentley et al. teach an image producing system for three-dimensional pieces such as cereal pieces. The system produces a representation of a combination of the cereal pieces in a container such as a bowl (Abstract). A user specifies shape characteristics for the cereal pieces such as size and texture, and three-dimensional models of the cereal pieces are generated. A container tool allows the modeled cereal pieces to be dropped into a three-dimensional model of a bowl according to modeled gravitational effects (Abstract). The interaction of cereal pieces with each other and the bowl are also modeled to simulate real cereal pieces falling into a bowl. A computer-rendered image is generated from the modeled cereal pieces and bowl, and the image is used to obtain product feedback (col. 2, line 33).

The bowl is not defined as a solid model that is at least partially filled with contents on the basis of a shape condition, as required by the claims. For example, the bowl is neither defined nor generated with respect to the parameters of possible contents for the bowl, as taught by Applicants. The bowl is modeled independently of the cereal pieces as an empty container. Unlike Applicants, Bentley et al. do not teach pre-defining shape conditions such as capacity or fill level in order to control a final shape or size of the modeled bowl. The bowl is individually filled with cereal pieces that are modeled independently of the bowl. Bentley et al. teach selecting the size and shape characteristics of the cereal pieces so that an ideal number of cereal pieces fit inside of the bowl (col. 11, line 8). However, the bowl is not defined or generated based on the shape characteristics.

Applicants teach first inputting parametrically defined shape conditions such as capacity, fill level, and thickness for a container as well as a desired shape of the container. Then, an outer shape of the container is defined and displayed based on the shape conditions. The resulting size and shape of the container automatically conform to the pre-defined shape conditions. This allows a user to quickly and easily design a container having a desired shape and pre-defined characteristics without requiring complicated calculations or detailed schematics. Additionally, a capacity modulation module automatically adjusts the shape of the container as a secondary processing is performed so that the container continues to conform to the pre-defined shape conditions.

Therefore, it would not have been obvious to combine the bowl and cereal modeling system taught by Bentley et al. with the three-dimensional modeling system taught by Lee et al. in order to achieve a system for defining a three-dimensional outer shape of a hollow container as a solid model that is at least partially filled with contents on the basis of a shape condition.

Claims 2-9 depend directly or indirectly from Claim 1 and are allowable over Lee et al. and Bentley et al. for the same reasons.

Referring to Claim 8, Lee et al. do not show, teach, or suggest fixing a shape of a finished portion of a hollow container when an outer shape of the hollow container is subjected to a secondary processing.

Lee et al. teach a method for designing geometric objects in a computer aided design (CAD) system. The geometric objects include surfaces that are designed to interpolate two parametric surfaces (paragraph [0092]). Feature curves located at and

between the parametric surfaces also provide constraints on the surfaces. Geometric characteristics of both parametric surfaces are imposed on the interpolating surfaces (paragraphs [0093] and [0094]). Additionally, the surfaces interpolate through one or more feature curves between the parametric surfaces. This allows a designer to design a surface that is specified in terms of a small number of feature curves and desired slopes of the surface along the feature curves (paragraph [0096]).

Lee et al. teach deforming surfaces by changing geometric characteristics of the surfaces (paragraph [0043]). However, Lee et al. do not teach that a portion of a surface remains fixed when another portion of the surface is deformed. Lee et al. teach that geometric constraint criteria are capable of being applied to geometric objects (paragraph [0046]). For example, Lee et al. teach that features and/or subgeometry of a geometric object are capable of being constrained to lie within another geometric object. However, the Examiner implies that applying geometric constraint criteria to a geometric object before a deformation operation as taught by Lee et al. and fixing a shape of a finished portion of a hollow container before a secondary processing as taught by Applicants are analogous. **Final Office Action at 8.** Applicants disagree.

To the contrary, Lee et al. teach that a first geometric object is constrained to lie within a second geometric object so that as the features of the second geometric object are deformed, the features of the first geometric object deform correspondingly (paragraph [0046]). In other words, Lee et al. teach applying geometric constraint criteria to a geometric object so that the geometric object and the object to which it is constrained jointly deform when a deformation operation is performed. Therefore, a

finished portion of a geometric object does not remain fixed when the geometric object is deformed in the system taught by Lee et al.

Referring to Claim 10, Lee et al. do not show, teach, or suggest defining a three-dimensional outer shape of a hollow container as a solid model that is at least partially filled with contents on the basis of a shape condition, as admitted by the Examiner. **Final Office Action at 6.**

Bentley et al. do not remedy the shortcomings of Lee et al. The arguments made above with respect to Claim 1 are equally applicable to Claim 10. The bowl taught by Bentley et al. is not defined as a solid model that is at least partially filled with contents on the basis of a shape condition. The bowl is neither defined nor generated with respect to the parameters of possible contents for the bowl. Bentley et al. do not teach pre-defining shape conditions such as capacity or fill level in order to control a final shape or size of the modeled bowl.

Therefore, it would not have been obvious to combine the bowl and cereal modeling system taught by Bentley et al. with the three-dimensional modeling system taught by Lee et al. in order to achieve a system for defining a three-dimensional outer shape of a hollow container as a solid model that is at least partially filled with contents on the basis of a shape condition.

Claims 11-17 depend directly or indirectly from Claim 10 and are allowable over Lee et al. and Bentley et al. for the same reasons.

Referring to Claim 16, Lee et al. do not show, teach, or suggest fixing a shape of a finished portion of a hollow container when an outer shape of the hollow container is subjected to a secondary processing.

The arguments made above with respect to Claim 8 are equally applicable to Claim 16. Lee et al. do not teach that a portion of a surface remains fixed when another portion of the surface is deformed. Lee et al. teach that a first geometric object is constrained to lie within a second geometric object so that as the features of the second geometric object are deformed, the features of the first geometric object deform correspondingly. Therefore, a finished portion of a geometric object does not remain fixed when the geometric object is deformed in the system taught by Lee et al.

Referring to Claim 18, Lee et al. do not show, teach, or suggest a solid model definition module for defining a three-dimensional outer shape of a hollow container as a solid model that is at least partially filled with contents on the basis of a shape condition, as admitted by the Examiner. **Final Office Action at 6.**

Bentley et al. do not remedy the shortcomings of Lee et al. The arguments made above with respect to Claim 1 are equally applicable to Claim 18. The bowl taught by Bentley et al. is not defined as a solid model that is at least partially filled with contents on the basis of a shape condition. The bowl is neither defined nor generated with respect to the parameters of possible contents for the bowl. Bentley et al. do not teach pre-defining shape conditions such as capacity or fill level in order to control a final shape or size of the modeled bowl.

Therefore, it would not have been obvious to combine the bowl and cereal modeling system taught by Bentley et al. with the three-dimensional modeling system taught by Lee et al. in order to achieve a system for defining a three-dimensional outer shape of a hollow container as a solid model that is at least partially filled with contents on the basis of a shape condition.

Claims 19-26 depend directly or indirectly from Claim 18 and are allowable over Lee et al. and Bentley et al. for the same reasons.

Referring to Claim 25, Lee et al. do not show, teach, or suggest fixing a shape of a finished portion of a hollow container when an outer shape of the hollow container is subjected to a secondary processing.

The arguments made above with respect to Claim 8 are equally applicable to Claim 25. Lee et al. do not teach that a portion of a surface remains fixed when another portion of the surface is deformed. Lee et al. teach that a first geometric object is constrained to lie within a second geometric object so that as the features of the second geometric object are deformed, the features of the first geometric object deform correspondingly.

Referring to Claim 27, Lee et al. do not show, teach, or suggest a solid model definition module for defining a three-dimensional outer shape of a hollow container as a solid model that is at least partially filled with contents on the basis of a shape condition, as admitted by the Examiner. **Final Office Action at 6.**

Bentley et al. do not remedy the shortcomings of Lee et al. The arguments made above with respect to Claim 1 are equally applicable to Claim 27. The bowl taught by Bentley et al. is not defined as a solid model that is at least partially filled with contents on the basis of a shape condition. The bowl is neither defined nor generated with respect to the parameters of possible contents for the bowl. Bentley et al. do not teach pre-defining shape conditions such as capacity or fill level in order to control a final shape or size of the modeled bowl.

Therefore, it would not have been obvious to combine the bowl and cereal modeling system taught by Bentley et al. with the three-dimensional modeling system taught by Lee et al. in order to achieve a system for defining a three-dimensional outer shape of a hollow container as a solid model that is at least partially filled with contents on the basis of a shape condition.

Claims 28-35 depend directly or indirectly from Claim 27 and are allowable over Lee et al. and Bentley et al. for the same reasons.

Referring to Claim 34, Lee et al. do not show, teach, or suggest fixing a shape of a finished portion of a hollow container when an outer shape of the hollow container is subjected to a secondary processing.

The arguments made above with respect to Claim 8 are equally applicable to Claim 34. Lee et al. do not teach that a portion of a surface remains fixed when another portion of the surface is deformed. Lee et al. teach that a first geometric object is constrained to lie within a second geometric object so that as the features of the second geometric object are deformed, the features of the first geometric object deform correspondingly.

Claims 7, 9, 15, 17, 24, 26, 33, and 35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee et al. (U.S. Pat. App. Pub. No. 2004/0085311) in view of Bentley et al. (U.S. Pat. No. 6,437,784) and Smith et al. (U.S. Pat. No. 5,864,777). This rejection is respectfully traversed.

Referring to Claim 7, Lee et al. do not show, teach, or suggest a capacity modulation module for performing a shape modulation upon an outer shape of a hollow container in order that a container capacity after a shape modulation has a capacity

determined by a shape condition, as admitted by the Examiner. **Final Office Action at 11.**

Smith et al. do not remedy the shortcomings of Lee et al. Smith et al. teach a method of predicting the volume of finished combustion chambers from a raw cylinder head casting. The cylinder head geometry of a raw cylinder head casting is captured and transformed into a machining coordinate system (Abstract). The raw cylinder head casting based on the transformed geometry is virtually machined, and the volumes of the combustion chambers are then calculated. Signed volumes of components such as spark plugs or valves are added to the calculated volume to obtain a finished volume (Abstract). A user compares a desired volume to the finished volume and adjusts a mold for the raw cylinder head casting as necessary in order to achieve the desired volume.

Smith et al. teach that the cylinder head geometry of the raw cylinder head casting is captured and virtually machined in order to calculate volume. However, Smith et al. do not teach automatically adjusting the cylinder head geometry so that the finished volume is equal to the desired volume. Smith et al. teach manually altering the shape of a physical mold that is used to produce the raw cylinder head casting when the finished and desired volumes differ. In this case, a new raw cylinder head casting must be produced and the cylinder head geometry of the new raw cylinder head casting must be captured before the volume adjustment can be verified. Therefore, unlike with the system taught by Applicants that automatically adjusts an outer shape of a hollow container to maintain pre-defined shape conditions, it is complicated and time consuming to verify volume adjustments in the system taught by Smith et al.

Claim 9 depends directly from Claim 7 and is allowable over Lee et al., Bentley et al., and Smith et al. for the same reasons.

Referring to Claim 15, Lee et al. do not show, teach, or suggest performing a shape modulation upon an outer shape of a hollow container in order that a container capacity after a shape modulation has a capacity determined by a shape condition, as admitted by the Examiner. **Final Office Action at 11.**

Smith et al. do not remedy the shortcomings of Lee et al. The arguments made above with respect to Claim 7 are equally applicable to Claim 15. Smith et al. teach manually altering the shape of a physical mold that is used to produce the raw cylinder head casting when the finished and desired volumes differ. A new raw cylinder head casting must be produced and the cylinder head geometry of the new raw cylinder head casting must be captured before the volume adjustment can be verified. Therefore, it is complicated and time consuming to verify volume adjustments in the system taught by Smith et al.

Claim 17 depends directly from Claim 15 and is allowable over Lee et al., Bentley et al., and Smith et al. for the same reasons.

Referring to Claim 24, Lee et al. do not show, teach, or suggest a capacity modulation module for performing a shape modulation upon an outer shape of a hollow container in order that a container capacity after a shape modulation has a capacity determined by a shape condition, as admitted by the Examiner. **Final Office Action at 11.**

Smith et al. do not remedy the shortcomings of Lee et al. The arguments made above with respect to Claim 7 are equally applicable to Claim 24. Smith et al. teach

manually altering the shape of a physical mold that is used to produce the raw cylinder head casting when the finished and desired volumes differ. A new raw cylinder head casting must be produced and the cylinder head geometry of the new raw cylinder head casting must be captured before the volume adjustment can be verified. Therefore, it is complicated and time consuming to verify volume adjustments in the system taught by Smith et al.

Claim 26 depends directly from Claim 24 and is allowable over Lee et al., Bentley et al., and Smith et al. for the same reasons.

Referring to Claim 33, Lee et al. do not show, teach, or suggest a capacity modulation module for performing a shape modulation upon an outer shape of a hollow container in order that a container capacity after a shape modulation has a capacity determined by a shape condition, as admitted by the Examiner. **Final Office Action at 11.**

Smith et al. do not remedy the shortcomings of Lee et al. The arguments made above with respect to Claim 7 are equally applicable to Claim 33. Smith et al. teach manually altering the shape of a physical mold that is used to produce the raw cylinder head casting when the finished and desired volumes differ. A new raw cylinder head casting must be produced and the cylinder head geometry of the new raw cylinder head casting must be captured before the volume adjustment can be verified. Therefore, it is complicated and time consuming to verify volume adjustments in the system taught by Smith et al.

Claim 35 depends directly from Claim 33 and is allowable over Lee et al., Bentley et al., and Smith et al. for the same reasons.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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